



1309.43448X00

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: Satoru OZAKI et al.  
Application No.: 10/766,850  
Filed: January 30, 2004  
For: STORAGE SYSTEM, STORAGE CONTROL DEVICE, AND  
DATA RELAY METHOD USING STORAGE CONTROL  
DEVICE  
Group: 2188  
Examiner: M. Padmanabhan

**REQUEST FOR RECONSIDERATION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

June 28, 2005

Sir:

In response to the Decision on Petition dated June 2, 2005, reconsideration and withdrawal of the Decision is respectfully requested in view of the following remarks.

**REMARKS**

Initially, in the Decision on Petition dated June 2, 2005, the Examiner asserts that the Petition to Make Special filed March 31, 2005 is defective for failing to discuss the claimed limitations with respect to the reference.

It is submitted that the cited references, whether considered alone or in combination, fail to disclose or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to disclose or suggest in combination with the other limitations recited in the claims:

a first feature of the present invention as recited in independent claim 1 including a first virtual volume which is associated with a real volume and forms a pair with a copy source volume of said first storage control device; a second virtual volume which is associated with said real volume and forms a pair with a copy destination volume of said third storage control device; and wherein said real volume is mapped to said second virtual volume, and said second virtual volume is mapped to said first virtual volume;

a second feature of the present invention as recited in independent claim 2 including a first virtual volume which is associated with a real volume and forms a pair with a copy source volume of said first storage control device; a second virtual volume which is associated with said real volume and forms a pair with a copy destination volume of said third storage control device; and a third control unit for reflecting storage contents of said second virtual volume in storage contents of said copy destination volume;

a third feature of the present invention as recited in independent claim 6 including a first virtual volume which is associated with a real volume and forms a pair with a copy source volume of said first storage control device; a second virtual volume which is associated with said real volume and forms a pair with a copy destination volume of said third storage control device; and a third control unit for reflecting storage contents of said second virtual volume in storage contents of said copy destination volume; and

a fourth feature of the present invention as recited in independent claim 16 including setting a first virtual volume and a second virtual volume, each being associated with a real volume, into said second storage control device; forming a first pair from said first virtual volume and a copy source volume of said first storage control device; forming a second pair from said second virtual volume and a copy destination volume of said third storage control device; and synchronizing storage contents of said second virtual volume and storage contents of said copy destination volume.

To the extent applicable to the present Petition, Applicants submit that although the distinguishing feature(s) may represent a substantial portion of the claimed invention, the claimed invention including said feature(s) and their inter-operation provides a novel storage system and system and method related to or implemented in or by said storage system not taught or suggested by any of the references of record.

The references considered most closely related to the claimed invention are briefly discussed below:

**U.S. Patent No. 6,389,420 B1 (Vahalia et al.)** discloses file locks and file metadata are distributed from a file manager to clients in a data network to permit the clients to share access to file data in data storage. The file manager is permitted to grant a second lock upon the file data without necessarily receiving notification from a client that it has relinquished a first lock on the file data while ensuring that conflicting locks are never granted. The client sets the beginning of a first period of time over which the client may access the file data once the first lock on the file data has been granted by the file manager, and the client sends a lock request to the file manager. The file manager responds by setting the beginning of a second period of time such that the first period of time is certain to have expired once the second period of time has expired, granting the first lock upon the file data to the client, and transmitting a lock grant message to the client. The client receives the lock grant message, and accesses the file data so long as the client's access to the file data will be completed by expiration of the first period of time. However, unlike the present invention, Vahalia et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 2, the above described third feature of the present invention as recited in independent claim 6 and the above described fourth feature of the present invention as recited in

independent claim 16, in combination with the other limitations recited in each of the independent claims.

**U.S. Patent Publication No. 2003/0110157 A1 (Maki et al.)** discloses a computing system and an exclusive access control method are provided for preventing degraded performance of a network caused by exclusive access control, and for permitting a computer to exclusively access a storage area irrespective of whether a storage has an exclusive access control function. In the computing system in which a plurality of computers and an external storage device storing shared data are connected through a relay, exclusive access control is executed by a device other than the storage. Specifically, the relay having a virtualizing function is instructed to execute exclusive access control. The relay has information indicating whether a storage area on the storage is an exclusive access area, so that the relay determines based on this information whether an access request received from a computer requests an access to an exclusive access area, and executes exclusive access control when it is an access request. However, unlike the present invention, Maki et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 2, the above described third feature of the present invention as recited in independent claim 6 and the above described fourth feature of the present invention as recited in independent claim 16, in combination with the other limitations recited in each of the independent claims.

**U.S. Patent Publication No. 2004/0006587 A1 (McConnell et al.)** discloses an information handling system. The system includes a first node having a first clustering agent. The first node also includes a first mirror storage agent that is coupled to the first clustering agent and a first internal storage facility. The system also includes a second node having a second clustering agent that is coupled to communicate with the first clustering agent. The second node also includes a second mirror storage agent coupled to the second clustering agent and a second internal storage facility. The first and second mirror storage agents receive storage commands. Those storage commands are relayed from each mirror storage agent to both the first and second internal storage facilities. However, unlike the present invention, McConnell et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 2, the above described third feature of the present invention as recited in independent claim 6 and the above described fourth feature of the present invention as recited in independent claim 16, in combination with the other limitations recited in each of the independent claims.

**U.S. Patent No. 2004/0186898 A1 (Kimura et al.)** discloses enhancing reading speed of data from a disk device in a computer system capable of transmission and reception of the data via a node device 200 between a client 100 and a storage device 300. A share volume PDc and specific volumes PDa and PDb are defined in the disk device on the storage device 300. Common data among

respective clients and specific data corresponding to the individual client are stored in the share volume and specified volumes, respectively. Once respective clients request virtual volumes VDa and VDb to read the data, the storage device reads out the corresponding data from the share volume or the specific volume. This application avoids lowering the reading speed regardless of the concentration of accesses from a plurality of clients because most data can be read from the share volume. However, unlike the present invention, Kimura et al. does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 2, the above described third feature of the present invention as recited in independent claim 6 and the above described fourth feature of the present invention as recited in independent claim 16, in combination with the other limitations recited in each of the independent claims.

**U.S. Patent Publication No. 2004/0205145 A1 (Murakami)** discloses when destinations of memory devices constituting one virtual volume increase, a relay device performs data transfer among plural memory devices such that a structure of the virtual volume can be changed so as to reduce the destinations of the memory devices as much as possible with this increase in the destinations as an opportunity for data transfer. In addition, when memory areas with a relatively small capacity increase among unused memory areas in which a virtual volume is not constituted, the relay device performs data transfer among the plural memory devices such that the number of the memory areas with a small capacity is reduced as much as

possible with this increase in the memory areas as an opportunity for data transfer. However, unlike the present invention, Murakami does not disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 2, the above described third feature of the present invention as recited in independent claim 6 and the above described fourth feature of the present invention as recited in independent claim 16, in combination with the other limitations recited in each of the independent claims.


Therefore, since the cited references fail to disclose or suggest the above described first feature of the present invention as recited in independent claim 1, the above described second feature of the present invention as recited in independent claim 2, the above described third feature of the present invention as recited in independent claim 6 and the above described fourth feature of the present invention as recited in independent claim 16, in combination with the other limitations recited in each of the independent claims, it is submitted that all of the claims are patentable over the cited references whether said references are taken individually or in combination with each other.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 1309.43448X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



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